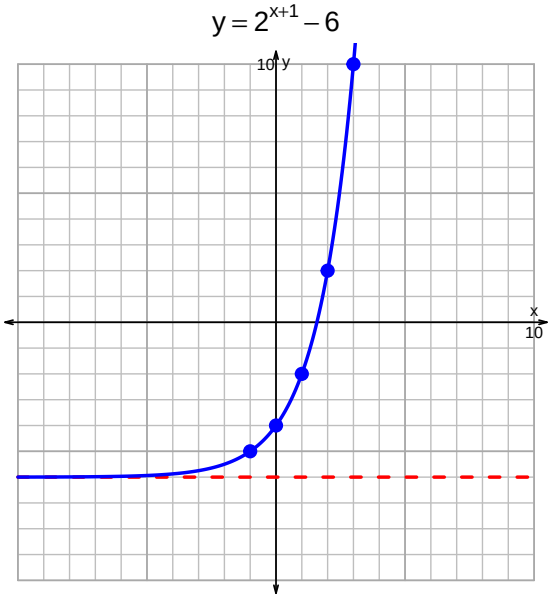
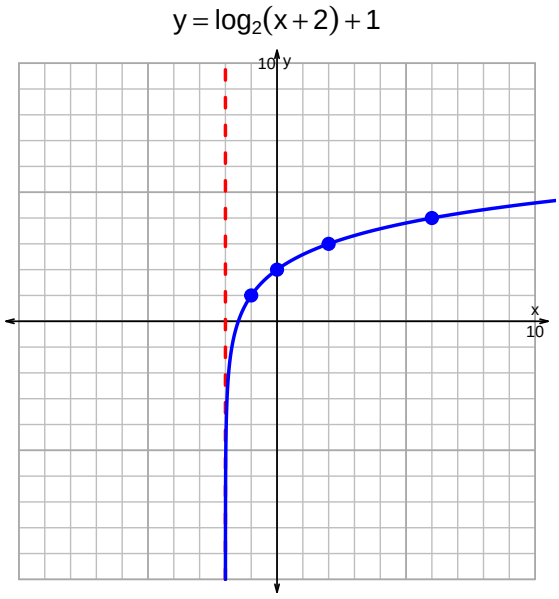
Name: Date:

s18: EXP LOG (SLTN v369)

1. (10 pts) Graph $y = 2^{x+1} - 6$ and $y = \log_2(x+2) + 1$ on the grids below. Also, draw any asymptotes with dashed lines.





Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$13 = \left(\frac{7}{4}\right) \cdot 10^{-3t/5}$$

Divide both sides by $\frac{7}{4}$.

$$\frac{13 \cdot 4}{7} = 10^{-3t/5}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{13 \cdot 4}{7}\right) = \frac{-3t}{5}$$

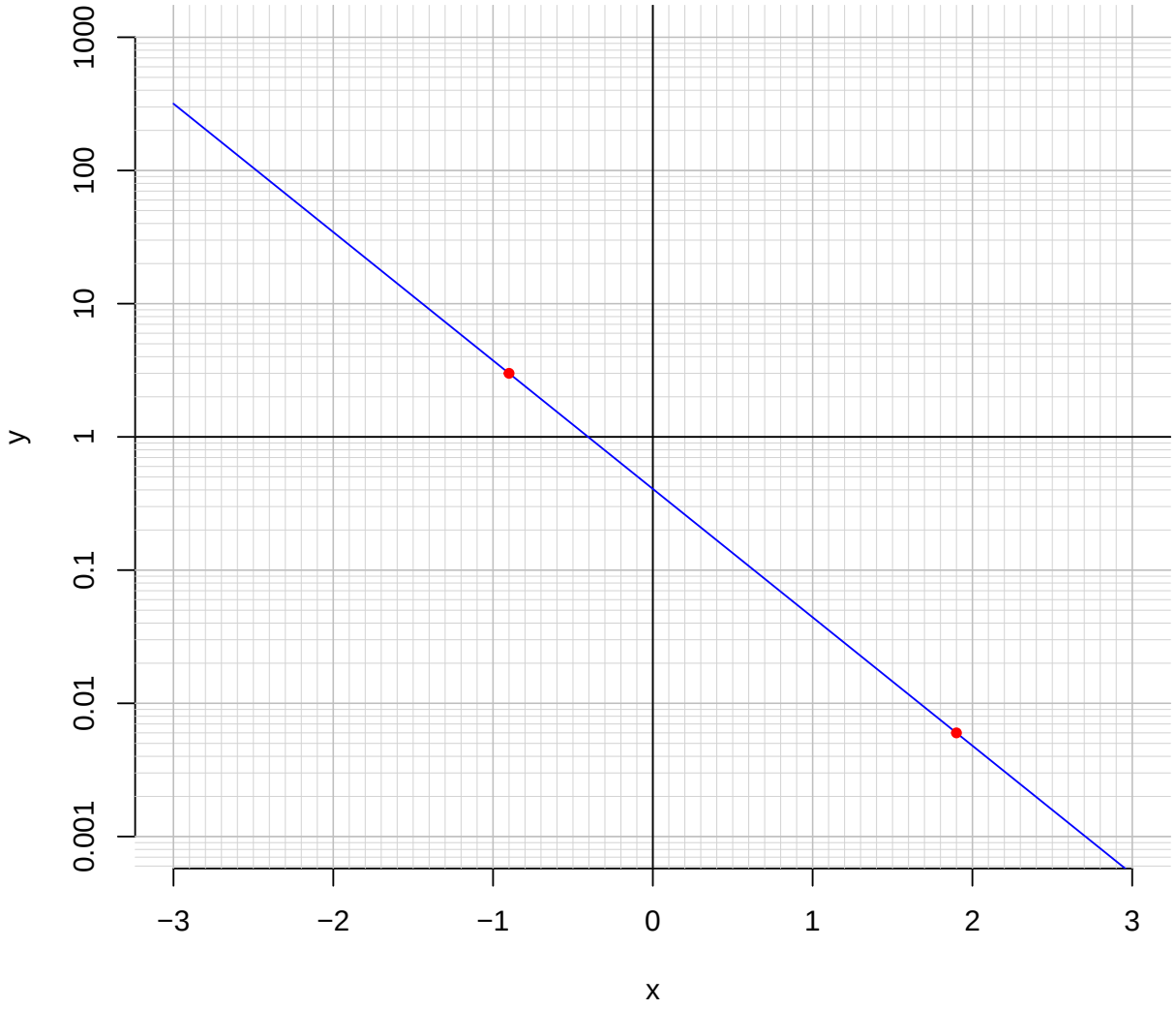
Divide both sides by $\frac{-3}{5}$.

$$\frac{-5}{3} \cdot \log_{10}\left(\frac{13 \cdot 4}{7}\right) = t$$

Switch sides.

$$t = \frac{-5}{3} \cdot \log_{10}\left(\frac{13 \cdot 4}{7}\right)$$

3. (10 pts) An exponential function $f(x) = 0.407 \cdot e^{-2.22x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(1.9)$.

$$f(1.9) = 0.006$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{2.22} \cdot \ln\left(\frac{x}{0.407}\right)$$

Using the plot above, evaluate $f^{-1}(3)$.

$$f^{-1}(3) = -0.9$$